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ABSTRACT

Findings of two doctoral research studies analyzing the organizational and instructional characteristics of successful reading and mathematics developmental programs in Texas community colleges are presented in this report. The first paper describes a 1989-90 analysis of developmental reading test scores to determine the characteristics of the most successful developmental reading programs in the state with at least 20% Hispanic and/or African-American representation. This paper indicates that programs were evaluated with respect to aggregated reading test rate, and provides the following characteristics common to the eight most successful programs: (1) a whole-language approach employing computer-assisted instruction, study skills, mentorships, and method evaluation; (2) administrative support for developmental studies; (3) written philosophy and goals; (4) academic department control; (5) academic counseling after assessment; (6) secondary assessments for placement; (7) course restrictions and strict attendance policy; (8) student orientation; and (9) class sizes limited to 20 or less. The second study reviews a similar study examining developmental mathematics programs in Texas, concluding that successful programs assigned high value to basic skills education; were offered through the math department; had well-defined policies and practices regarding assessment and placement of remedial students; and offered lecture-based instruction with math laboratories for learning support. (KP)

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PRESENTATION PROPOSAL

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Laredo Community College
Department Chair Reading & Speech

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Houston Community College District

Goal: To present the findings of two doctoral research studies the purpose of which was to describe and analyze the organizational and instructional characteristics of successful developmental programs at eight identified community colleges in Texas whose student populations included at least 20 percent Hispanic and African-American students.

Content: An explanation and participative discussion of the background, current literature, research design, findings and conclusions of the studies.

Abstract:

Effective educational programs which assist minority students with acquisition of basic academic skills are needed if the trend of reduced minority student participation and completion in higher education is to be curbed. Tinto(1985) recommends that policies and programs which integrate students into college life are needed, but most importantly, administrators, faculty, and staff are needed to convey the philosophy of retention to students in their daily encounters with them. To do less, especially at community colleges where the majority of African-American and Hispanic students who go to college attend, will have serious societal repercussions. Roueche and Roueche (1993) have outlined what a successful developmental program should include. Based on a conceptual framework and using a collaboratively produced interview guide, the researchers interviewed community college developmental education faculty and administrators concerning the program at their college.

There was much variety, but there were similarities in some key areas: a decentralized format, although that feature was being reconsidered, dedicated faculty and multiple approaches to instruction. In the reading area, the whole-language approach was being used in some manner at four of the six highest ranked colleges. The most significant feature of the math programs was the use of mathematics labs to provide

small group and personalized instruction. In addition, "time spent up front" on assessment, placement, and adjustment initial placement was the single policy-related factor whose importance to student success was most widely acknowledge by respondents. The mandatory nature of the Texas Academic Skills Program itself was observed to be a positive influence on instruction because students who enter college-level courses are better prepared.

Format: The presenters used a procedure for new conferencing recommended by Berthoff in Freiere and Macedo(1987) which incorporated the concept of the teacher as learner and learner as teacher. Freire has stated that conferences are conducted using the old lecture method which is obsolete because it assumes that the only one who has a book or who can read for that matter is the teacher. This is not so. Therefore, the participants first walked around the room reading large posters explaining the methodology, results, and recommendations from the study. Then the participants shared areas of interest which they wanted the presenters to elaborate on. These were tabulated and the rest of the time was a participative discussion in which the whole group was involved.

The doctoral dissertation research provided the presenters with the opportunity to study current reading and mathematics developmental programs identified as successful. Combined with over three decades of combined experience at the community college, the presenters were pleased to share findings and insights as requested by the participants. According to Berthoff, "Paolo Freire has the audacity to believe that teachers must learn from their students in dialogue" (Berthoff in Freire and Macedo, 1987). The dialogue which the presenters pursued resulted in true sharing.

A DESCRIPTION AND ANALYSIS OF SELECTED SUCCESSFUL DEVELOPMENTAL READING PROGRAMS IN TEXAS COMMUNITY COLLEGES

Publication No. _____

Nora Ramírez Garza, Ph.D.

The University of Texas at Austin, 1994

Supervisors: John E. Roueche and William Moore, Jr.

The number of African-American and Hispanic students in higher education has decreased significantly (Angel & Barrera, 1990; Nettles, 1988), and the persistence and the completion rates for these students have also decreased. Furthermore, many minority students were found to require basic academic skills remediation. These were not the only students so identified, but they were disproportionately represented in developmental courses. Educators in Texas community colleges were concerned that with the added pressure of accountability measures such as the Texas Academic Skills Program tests the number of minority students completing degrees would be further reduced. Community college administrators have had to focus on improving the effectiveness of developmental programs.

In order to describe and analyze successful Texas community college developmental reading programs, archival data on the TASP Reading Test for the 1989-90 community college test cohort were used to select the eight most successful community college developmental reading programs with at least a 20 percent Hispanic and/or African-American representation in three categories: highest overall, highest Texas-Mexico border colleges, and highest large urban colleges. Successful was defined as the highest aggregated reading TASP pass rate for each individual college by ethnic designation. An interview guide based on current literature was used to interview community college developmental studies administrators and designated others. Data analysis involved qualitative and computerized word processing techniques described by Tesch (1990) and modified by the researcher.

There were some important similarities among successful developmental reading programs. The organizational characteristics included administrative support, written philosophy and goals, and academic department control of developmental studies. The academic policies at the selected colleges included

assessment and placement, secondary assessment, course restrictions by reading level, a strict attendance policy, and an orientation for students. Reading faculty were described by the interviewees as highly motivated and collaborative. Programs included study skills instruction and tutorials. Most significant in the instructional area was the use of the whole-language approach in reading. Student support efforts included learning centers, child care, and minority student services. Evaluation was used at the student, faculty, and program level to monitor and increase student success. The whole-student approach to remediation which combined the efforts of the entire college was evident.

RESEARCH QUESTIONS

The research questions included, but were not limited to, the following:

1. Which Texas community college developmental reading programs were most successful with African-American and Hispanic students, as measured by the Texas Academic Skills Program (TASP) outcomes?
2. What were the assessment/placement policies and practices of successful developmental reading programs?
3. What were the professional characteristics of faculty in successful developmental reading programs?
4. What were the curricula, instructional methods, and materials utilized in successful developmental reading programs?
5. What were the student support services offered by successful developmental reading programs?
6. What were the program evaluation methods used in successful developmental reading programs?

DESIGN AND METHODOLOGY SUMMARY

In order to study effective Texas community college developmental reading programs, a qualitative descriptive research design was used. Using the archival data on the TASP reading test for the 1989-90 community college test cohort which was available in raw form from the Texas Higher Education Coordinating Board, with particular emphasis on the success of African-American and Hispanic students, eight sites were selected for study. Using a collaboratively produced interview guide based on the literature, the interviews were taped, transcribed, and later analyzed for the production of individual case study reports and one multi-case report. The interviewees were community college developmental studies administrators and designated others who were interviewed in person and later by telephone if necessary. Data analysis involved qualitative and computerized word processing techniques as described by Tesch (1990) and modified by the researcher to represent the patterns implied by the data. Some obvious limitations to this type of research were noted.

FINDINGS

Findings from both the quantitative and qualitative analysis of the data provided in the interviews indicated that there were some important similarities in the instructional characteristics and in the organizational features of successful developmental programs.

INSTRUCTIONAL AREA

In the **instructional area**, developmental reading programs employed predominantly full-time, credentialed faculty characterized as highly competent, collaborative, caring, and dedicated. At most colleges reading teachers taught a "mixed" schedule of classes.

The whole-language approach was being implemented in 50 percent of the *successful* programs. Serendipity, as described by Tesch (1990), resulting from the open-nature of the interview guide provided this important finding. Fifty percent or more of the successful programs were described as employing:

* computer-assisted instruction
* study skills instruction
* mentorships developed from tutorials
* evaluation of methods

ORGANIZATIONAL CHARACTERISTICS

Over 60 percent of the successful colleges were described as exemplifying the following organizational characteristics:

* administrative support for developmental studies
* written philosophy and goals
* academic department control of developmental studies
* evaluation

As characterized by the interviewees and the documentation provided, developmental studies was a need which was acknowledged and addressed. The mandatory nature of the Texas Academic Skills Program was observed to be a positive influence on classroom climate to the extent that it restricted participation in college-level instruction by those who were not adequately prepared.

ACADEMIC POLICIES

Academic policies were in place to provide the necessary structure and focus which developmental studies students have been identified to require. Sixty percent of the successful colleges were described as implementing policies to support student success including, but not limited to, the following:

* academic counseling after assessment
* use of the pre-TASP for assessment
* secondary assessments for placement
* course restrictions
* strict attendance policy
* orientation of students
* limited class size 20 or under

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STUDENT SERVICES

The student services provided at these colleges were similar. These services were provided to all students, but in some cases specifically to developmental studies students. These services were seen as necessary in order to help students succeed academically. Unique or specialized services were offered at some campuses. These student services included, but were not limited to, the following:

* work study
* learning assistance center/tutorials
* financial aid
* child care
* career education
* minority student services

CONCLUSIONS

There was much variety, but there were more similarities than differences in some key areas.

Among these were a decentralized format, dedicated faculty, and multiple approaches to instruction, many of which emphasized technology and a whole-language approach to the teaching of reading. A three-pronged approach was used at the highest-ranked institutions: computer labs with teacher supervision, tutorial courses, and developmental courses which involved all components of the college.

* COLLABORATION
* "Sí Se Puede" Attitude
* Scholarship Fund
* Whole-Language Approach

RECOMMENDATIONS

Administrators should support developmental studies needs in the budget and structure of the college.

Academic policies which provide structure for students should be implemented: mandatory assessment and placement, strict attendance policies, academic advisement, and restricted classes.

Class size should be limited in order to create situations which foster mentoring relationships. Student services should include a learning center, peer/faculty tutoring, financial aid, child care, work study, career education, and minority student services.

The academic leadership should be alert to hire and provide support for motivated faculty who work collaboratively and continue to learn from the literature and their students.

The instructional component should be three-pronged: classes, tutoring, and computer labs. The teaching of reading should be integrated with writing, speaking, and listening in real-life situations.

Test-taking strategies should be taught, but not to the extent that they fragment the act of communication of which reading is a part.

State funding for developmental studies should include resources to address the needs of the whole student: academic and personal.

RECOMMENDATIONS FOR FUTURE RESEARCH

The findings in this research suggested the need for more research on the whole-language approach, an approach which is less than ten years old. On the surface, the whole-language approach may look like another new gimmick. Book publishers now are producing texts that purport to use the whole-language approach. In its unadulterated form, whole-language, combined with the most current research and thought about the teaching-learning process and ways of teaching minority African-American and Hispanic youth, hold promise to meet the needs of *all* students, including minority students, in the areas of reading, writing, and mathematics.

A constellation of variables appeared to contribute to student success in developmental studies. Further research to investigate the impact of certain clusters of variables would serve to focus on those whole student needs which colleges must address if increases in student performance are to occur.

More research on the education of minority students should be conducted, distilled, and disseminated.

Analysis of Developmental Mathematics Programs in Texas Community Colleges Which Are Successful With Black and Hispanic Students

Linda L. Gibbs, Ph.D.

The University of Texas at Austin, 1994

Supervisors: John E. Roueche
William Moore, Jr.

Abstract

The purpose of the study was to identify community college programs of developmental mathematics in the state of Texas that have been successful with Black and Hispanic students, as measured by success in required mathematics remediation, and to analyze those programs. Selection of eight colleges for the study was accomplished by utilizing TASP data for the academic years 1989-90 and 1990-91 to determine in which developmental mathematics programs the greatest percentage of Black and Hispanic students had achieved success in remediation.

At the request of the researcher, informants were designated by the leadership of each college, and these individuals were personally interviewed on their respective campuses. The data collection was structured by an interview guide which had been developed and field-tested as part of the study. All interviews were tape recorded with the permission of the interviewees, results were transcribed, and data were analyzed using qualitative methods.

During data analysis, the use of mathematics laboratories emerged as an important topic about which more data were needed. Accordingly, a follow-up survey instrument was developed to elicit more information on the subject. The follow-up surveys were conducted by telephone with those individuals who were designated by previous informants as being most involved in the operation of their college's math laboratory. The interviews were tape recorded with the permission of the interviewees, results were transcribed, and data were incorporated into the analysis of each college's developmental mathematics program.

Conclusions of the study were that: selected colleges assigned high value to basic skills education; developmental mathematics was offered through the math department, although there was movement to centralization of developmental studies in a single unit; policies and practices regarding assessment and placement of students in remediation were crucial to student success; instruction was lecture-based with learning support offered through mathematics laboratories; the greatest need for student support services lay in the elimination of economically based barriers to access; and few colleges had well-developed evaluation designs in place. It was also concluded that, through its mandate of testing and remediation of basic skills education, the Texas Academic Skills Program has contributed energy and focus to that endeavor, encouraging developmental programs to grow in their ability to foster student success.

Details of the Study

Purpose

The purpose of this study was to identify and analyze the developmental mathematics programs offered at Texas community colleges in which Hispanic and Black students have experienced the greatest success.

Research Questions

1. What are the philosophy and goals of successful community college developmental mathematics programs?
2. How is the developmental mathematics unit organized within the overall college structure?
3. What are the academic policies and practices utilized to foster student success in developmental mathematics programs?
4. What are the predominant professional characteristics of developmental mathematics faculty in successful community college programs?
5. What are the instructional methods and materials commonly used in successful developmental mathematics programs?
6. What student support services are utilized in successful developmental mathematics programs?
7. What types of evaluations are performed in successful developmental mathematics programs, and how is information utilized to improve instruction?

Design of the Study

A qualitative, multiple-case study design was chosen for this study. An advantage of this design over that of the classic or single-case design is that it allows for comparisons among sites, and the evidence so gathered may be considered more compelling. In this study, each college comprises a case, within which are embedded the elements of analysis addressed by the individual research questions.

Selection of Sites

Population

The population of the study consisted of the remedial/ developmental programs of the "Texas Public Community Junior Colleges and Technical Institutes, Fall, 1989," as enumerated by the Texas Higher Education Coordinating Board (1990, p. 24).

In the state's public two-year colleges more than twenty thousand first-time college students enrolled and were tested using the Texas Academic Skills Program (TASP) Test during the academic year 1989-90; their scores, aggregated by college, served as the data base for this study. As a part of the newly mandated TASP, students who were first-time entrants into college during the academic year 1989-90 were individually tracked for the period beginning at enrollment and ending with the summer semester of 1991; although this procedure is continuous, data were not available for later academic years at the time the study was designed.

Data for Site Selection Process

Eight colleges were selected as examples of successful practices in developmental mathematics based on TASP student outcomes data, aggregated by college for the 1989-90 cohort of entering freshmen. The data were obtained from the Texas Higher

Education Coordinating Board (THECB) and they provided the basis on which the indicator of success was calculated.

The data were obtained from THECB in the form of two computer tapes which contained 219,215 records and 331,909 records for 1989-90 and 1990-91 respectively. Each individual record contained a summary of one student's TASP-related activities for that year encoded in EBCDIC language, IBM's method of data storage. The data were converted to ASCII, for use with the college district's computer system. Successive computer runs produced a cohort of 39,216 students who met the following conditions: 1) first enrolled in academic year 1989-90; 2) were TASP eligible; 3) tested as needing mathematics remediation; 4) enrolled at a two-year institution; 5) enrolled at a college whose eligible cases were comprised of a combined percentage of at least 18 percent Black and/or Hispanic students; 6) were also present in the 1990-91 data base.

Indicators of Success

Colleges were rank-ordered based on the percentages of students of a particular ethnic group who had completed mathematics remediation, during the two-year period, after having first failed mathematics section of the TASP Test. Programs reporting higher percentages of students completing required remediation were considered to be more successful than those reporting lower percentages of completion during the same period. Separate analyses were performed for Black and Hispanic student groups.

Stratifying the Sample

Using the rationale that certain groups of colleges face similar challenges and are therefore more comparable to each other than to colleges overall, the sample was stratified as follows: 1) border colleges, 2) colleges in large urban systems, 3) all other public two-year colleges. Within each of these three groups, colleges were sorted in two

separate operations based on the colleges' respective success rates of Hispanic and Black remedial students. When choosing between colleges whose percentages of student success were very close, geographic balance within the state was considered.

Student outcomes data furnished by THECB provided the indicator of success which was used to select Texas colleges which were most successful with each of the two ethnic groups during the first two years of TASP implementation. The sample was stratified in such a way that successful schools with both high and low minority participation were selected.

Data Collection Procedures

Data collection procedures consisted of a) obtaining archival and documentary data for use in selecting sites and in describing programs, and b) interviewing one or more informants from each site. The research population consisted of the administrators and lead instructors who had the primary responsibility for the developmental mathematics program in their respective institutions' hierarchies and who were designated by their presidents as the appropriate informants regarding the program.

A letter was used to introduce the study to the president of each college and to request that an individual be designated as key informant for the study. The letter to each president was followed with a telephone call to obtain information as to the designated respondent, and the latter was contacted to arrange a mutually convenient interview time.

Instrumentation

Interview Plan

A semi-structured interview with open-ended questions was used to gather data. Probing questions were used as needed to follow up on areas of particular relevance to the research questions.

Pilot Study

The interview plan and procedure were field tested at multiple locations in a college district chosen from the groups of those which were not selected for the study. Revisions were made in the interview as needed based on the field-testing experience.

Interview Procedure

All interviews were performed by the researcher or a colleague in person at the selected colleges. Respondents were the administrators and lead instructors designated by the college presidents as the most knowledgeable about the developmental programs. All interviews were tape recorded with the permission of respondents, and verbatim transcripts were produced. A checklist was utilized by the researcher to ensure that subtopics which did not arise naturally were queried during the interview process.

Follow-Up Study

Responses to the instructional portion of the interview indicated that the utilization of math laboratories was considered highly significant to student success at virtually all of the selected colleges. For this reason, a follow-up questionnaire was designed, field-tested, and administered to designated respondents at each college in the study. The purpose of the questionnaire was to provide more structured

information regarding the implementation of math labs. The interviews were conducted by telephone by the researcher, recorded with the permission of the respondents, and verbatim transcripts produced. The resulting information was included in each college's individual case study under the title of "Learning Support,".

Data Analysis Procedures

In this multiple-case study, the analyst began with individual cases guided by interview questions. As predicted in the section of this chapter dealing with instrumentation, considerable cross-case organization of the data resulted from the semi-structured interview plan. Further analysis proceeded by identifying categories into which the data fell, especially those unexpected categories which emerged during the data collection process. When categories had been identified, the text of the transcripts was indexed accordingly; a single passage was assigned multiple codes if it pertained to more than one conceptual area. Based on the analysis individual reports were prepared for each case; these and the conclusions from across all the cases are contained in a summary report developed as the result of the study.

Analysis and Conclusions

The stratified sample utilized in this study ensured that the selected colleges were varied in organizational type (large urban systems or single colleges) and geography (border colleges and all other colleges). Colleges in the category All Other Colleges tended to document higher percentages of students completing remediation than colleges in the categories of Urban Systems and Border Schools.

Conclusions of the Study

1. A belief in the fundamental importance of basic skills to student success in college was a universal characteristic of the goals and philosophy of developmental studies programs at the colleges. Developmental mathematics had been offered at these colleges for years previous to the establishment of the Texas Academic Skills Program.

2. Developmental mathematics was a component of the instructional programs of each of the selected colleges, rather than being part of their student services components. There is movement among these colleges away from a decentralized model—with developmental mathematics offered through the math department—to a centralized developmental studies unit.

3. The academic policies central to student success were those addressing assessment and placement of students in developmental or college-level courses. Local procedures were almost always more stringent than required by TASP regulations, and initial placement was often readjusted as needed during the semester.

4. The majority of faculty had advanced training in mathematics and little or no formal training in the instruction of developmental students. The developmental mathematics faculty was predominantly Anglo-American, and a caring attitude toward students was the crucial personal characteristic of successful instructors.

5. Instruction was predominantly lecture-based, and subject matter consisted of a generic progression through mathematics topics of increasing complexity.

6. Learning support was provided in the form of mathematics laboratories which offered one-on-one tutoring, collaborative work among students, and computer-assisted instruction. The math labs were regarded by faculty as the appropriate setting for personal contact with and among students.

7. The greatest needs for student support services were in the area of support for the life circumstances of individual students; all of the selected colleges were attempting to eliminate such significant barriers as economic need, responsibility for the care of small children, and lack of transportation.

8. Evaluation of the success of developmental mathematics programs was an area of great interest to informants, but only a few colleges have well-developed evaluation designs in place.

9. Through its mandate of testing and remediation of basic skills education, the Texas Academic Skills Program has contributed energy and focus to that endeavor, encouraging developmental programs to grow in their ability to foster student success.

Recommendations for Future Research

The conclusions of the study indicate the need for further research in several aspects of developmental mathematics programs:

- The acquisition of basic mathematics skills by adults;
- The implementation of centralized laboratory-based developmental studies programs; and
- Strategies for eliminating the personal circumstances which constitute barriers to persistence and student success.

Recommendations Drawn from Findings

The acquisition of mathematics skills and concepts by adults is an area which Schoenfeld (1989) characterized as uncharted and ripe for exploration. Direction for college instruction is often taken from research performed with youthful learners, despite a lack of certainty that its conclusions truly apply to adults. Little research has been conducted which explores creative methods of teaching basic mathematics to adults—methods which do not simply accommodate diverse learning styles but which utilize these differences to enhance the acquisition of math skills. Likewise, the teaching of learning skills for mathematics—as presented by Nolting (1991) and Ellis (1991)—must be emphasized in curriculum planning and through faculty development. More and better explanations of mathematical principles and algorithms only prolong the discomfort for adult students who have only experienced failure in the mathematics classroom. For an adult who, after a dozen or more years of schooling, has yet to learn basic mathematical principles and operations, the acquisition of math skills may be at least as much about math self-concept issues, self management techniques, and positive self-talk as about the subject matter itself. Research is needed to enlarge upon what is

known about teaching mathematics and to incorporate the knowledge into meaningful math instruction for adults.

Several of the selected colleges were found to be moving to a centralized model of developmental studies in which reading, writing, and mathematics were to be taught by the same instructional unit. In each case, the driving force appeared to be an administrative priority for the efficient use of funding through consolidation of laboratory space and equipment. It was stated by informants from two colleges that the perceived intent of administration was to reduce instructional staff while increasing reliance on computerized instruction. Reservations regarding these changes arise from concern for student success and an understanding of the needs of underprepared students: the need for frequent personal interaction with an instructor of tutor, the limitations on learning skills possessed by developmental students, the need for structure and learning skills development. Support systems must be developed and incorporated into mathematics programs which provide for students' learning needs while helping them gradually to develop the skills needed for self-directed learning. The utilization of laboratories to support traditional mathematics instruction would appear to be a positive direction and one which invites further research. As efforts will no doubt continue to reduce instructional costs in community colleges, creative ways must be found to economize while still providing needed structure and personal encouragement for developmental students. Administrators involved in re-centralizing developmental studies divisions will also be well advised to seek methods of retaining some of the benefits—less stigmatization of students and instructional staff—of a decentralized model even while moving to a centralized arrangement.

Instructional programs comprise only a small part of the adult student's life and, of themselves, they are often not adequate to keep an individual in school. Even the very best instruction in a quality program which is meeting an adult student's academic needs will rarely be continued if it conflicts with that individual's work and family

responsibilities or if economic need dictates otherwise. Treisman (1983) observed that many minority students who achieve entry into college do so against tremendous odds, indicating that lack of motivation is not likely to be the root cause of attrition for these students. Rather, personal circumstances and responsibilities which override academic goals in their urgency are more likely to interfere with persistence and success. Further, because such difficulties are demonstrably more likely to occur in the lives of minority students, many of whom have already experienced mediocre preparatory education, the effect of the immediate problem is multiplied. More and better ways must be found to eliminate economic obstacles to participation in higher education by all segments of the population.

Improved instructional techniques and curricula, a systematic approach to learning support, and increased support for students' personal circumstances are areas which must be further explored in order to increase meaningful access to higher education—the right to succeed rather than only the right to try.